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ABSTRACT

This study of the interaction between first- and second-born preschool-aged siblings in a naturalistic setting investigates imitative, prosocial and agonistic (aggressive) behavior in terms of age, sex and spacing variables. Thirty-four dyads of same sex siblings were observed for two 1-hour periods in their homes. The younger siblings averaged 20 months of age and the age interval between siblings was either large (2.5 to 4 years) or small (1 to 2 years). The sex of the dyad affected agonistic and prosocial behavior but not imitation. Males were more physically aggressive. Older females were more prosocial in their behavior than any of the other groups. Age of the children within the dyad affected agonistic, prosocial, and imitative behavior. Older children initiated agonistic and prosocial acts more often than their younger siblings. In response to agonistic acts, older children more often made a counterattack, whereas younger siblings more often submitted. Younger siblings imitated their older siblings more often than the older siblings imitated the younger. The interval between siblings had little effect on the patterning of interaction, although there were some indications that the small-interval male dyads were somewhat more negative in their interactions than the other groups. The findings of sex and age patterns and the high levels of interaction in all groups are discussed in terms of the potential importance of sibling interaction for social development. (Author/RH)

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SIBLING INTERACTION IN THE HOME

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Running head: Sibling Interaction

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Footnote

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Abstract

Thirty-four pairs of same-sex siblings were observed for two one-hour periods in their homes. The younger siblings averaged 20 months of age and the age interval between siblings was either large (2.5 to 4 years) or small (1 to 2 years). The sex of the dyad affected agonistic and prosocial behavior but not imitation. Males were more physically aggressive. Older females were more prosocial in their behavior than any of the other groups. Age of the children within the dyad affected agonistic, prosocial, and imitative behavior. Older children initiated agonistic and prosocial acts more often than their younger siblings. They also responded to agonistic acts by counterattacking more while younger siblings submitted more often to agonistic acts. Younger siblings imitated their older siblings more often. The interval between siblings had little effect on the patterning of interaction aside from some indications that the small-interval male dyads were somewhat more "negative" in their interactions. The findings of sex and age patterns and the high levels of interaction in all groups are discussed in terms of the potential importance of sibling interaction for social development.

Children interact with their siblings in the home and by so doing often acquire their first extensive social experience with other children. The potential importance of sibling effects has long been recognized in personality theory (e.g., Sampson, 1975); more recently the extension of empirical observations of mother-child interaction to father-child and peer interaction has encompassed the interaction of siblings (e.g., Lamb, 1978). Nevertheless, data on the interaction of siblings in the naturalistic setting of the home are conspicuously absent. The present study was designed to provide such data.

To simplify this initial study, we limited our observations to dyads of first- and second-born preschool-aged siblings. Both members of a dyad were either male or female and were separated in age by either a large interval (2.5 to 4 years) or a small interval (1 to 2 years). Sex and interval were included as factors in the design because the literature suggested these factors might have effects on sibling interaction. Age of sibling within the dyad (older and younger) was also expected to affect the child's responses since this factor includes age and birth-order differences and both might produce different patterns of interaction on the part of the older and younger siblings.

It is not clear what effect birth-order, apart from age, might have upon sibling interaction in the home. However, there is increasing speculation that birth-order differences among children may reflect different experiences with siblings, a view which supplements the more traditional view that birth-order effects are mediated by different parental treatment for different birth positions. For example, Zajonc and Markus (1975) attempted to account for IQ differences associated with birth-order, family size, and spacing by producing

a model in which both parent and sibling effects are included. In the model, parental and sibling behaviors combine to an overall level of intellectual sophistication in the family; the more siblings and the higher the birth-order, the lower the intellectual level of the family and the child's IQ. It is not specified exactly how the intellectual level of the family has its effects on IQ but imitation could play a part. Another facet of the Zajonc and Markus model is that the opportunity to teach younger siblings facilitates IQ; last-born siblings and only children suffer in this respect. The model is thus predicated on a significant amount of interaction between siblings, including both imitation and teaching. Zajonc and Markus, however, provide no data on sibling interaction in the home.

The implications birth-order may have for more purely social interactions among siblings are discussed by Miller and Maruyama (1976). They examined the relation between birth-order and peer popularity and found that later-born children were more popular than early-born children. They argue that this finding "seems to stem from differences in the interactions of sibling within the home setting (p.130)". In particular, they suggest that first-borns may act quite arbitrarily because of their greater power but that later-born children must develop social skills such as "powers of negotiation, accommodation, tolerance, and a capacity to accept less favorable outcomes (p.123)". These skills, in turn, may account for the greater popularity of later-borns among their peers. Again, these speculations exist in the absence of data concerning sibling interaction in the home.

It seems reasonable to assume that age, apart from birth-order, would affect the nature of responses of one sibling to another. Studies of children with same-aged peers show that social interactions vary as a function of age of the peer dyad. For example, Eckerman, Whatley, and Kutz (1975) showed that both positive and negative responses to peers increased across the second year of

life. Nevertheless, generalizations from studies of same-age peer interactions to different-age sibling dyads seem tenuous at best. More to the point are laboratory studies by Lamb (1978) and Samuels (Note 1) which compared the behaviors of older and younger siblings, although in these studies birth-order was unspecified. Lamb observed 18-month-olds and preschool-aged sibling dyads in a free-play setting. Older siblings were more likely to vocalize and proffer toys to their sibling. Younger siblings were more likely to watch, approach and imitate their older sibling and were more likely to take over toys abandoned by the older sibling. Samuels obtained very similar results from observations of a smaller sample of sibling dyads at approximately the same age points. Both investigators conclude that the older sibling may serve as a model for the younger child and Lamb asserts that the older child may play an important part in the infant's "mastery of the object environment".

Lamb also examined the effect of sex on sibling interactions by including both male and female same-sex dyads and cross-sex dyads in his design. He reported little effect of sex upon interaction in the free-play laboratory setting. Nevertheless, other findings indicate that the sex of the siblings may affect interaction in other contexts. Sutton-Smith and Rosenberg (1970) reported a variety of findings which suggest sex may modify interaction in the home. For example, they reported questionnaire data on techniques siblings use to influence each other and found that first-born males appeared to use more physical power techniques whereas first-born females were more likely to use techniques such as explaining, asking, and taking turns. Findings compatible with the picture of older sisters as more sensitive and skillful in interaction with younger siblings are reported by Cicirelli (1975); he found that older sisters were better "teachers" for their younger siblings in a laboratory problem-solving task. Finally, data on sex differences in peer interaction (e.g. Maccoby & Jacklin, 1974) suggest that sex might be expected to have some parallel effect

on the nature of sibling interaction.

Spacing between siblings is a variable of particular interest since parents have some control over this variable in planning their families. Practical advice concerning optimal spacing can be found in the research literature, but little direct evidence is available for evaluating these suggestions. One notion relevant to optimal spacing is that the mother's relationship with her children may be affected by the spacing between them. For example, Cornoldi and Fattori (1976) found that differences in adult personality in first-borns was partly a function of whether the first-born was spaced more or less than three years from the second-born sibling. These differences are interpreted as resulting from a less satisfactory mother-child relationship for the first-born who must share his mother in the "crucial" first three years of life. White (1975) also claims that the mother-child relationship is adversely affected by close spacing and claims further that sibling interaction is also adversely affected. In fact he states that the greatest source of stress for infants (and their mothers) stems from the "behavior of a not-much-older sibling", behavior which may be aggressive and hostile. No direct evidence is provided to support these assertions, although they presumably stem from White's extensive observations in the home. Some evidence for the idea that greater spacing produces more prosocial interactions between siblings is provided by a laboratory study of older siblings aiding younger siblings in a sorting task (Cicirelli, 1973). It was found that younger siblings were more likely to accept help or direction from an older sibling when the interval between siblings was large.

A rough summary of the existing speculation and data concerning sibling interaction can be made in terms of a division between prosocial and agonistic acts. Based on the literature reviewed above we expected that younger siblings

might act in more prosocial fashion than their older siblings and that the nature of prosocial acts would differ between the two ages. Prosocial behavior might also be more characteristic of female than male-sibling dyads, and more characteristic of large-interval dyads than small-interval dyads. Conversely we expected that agonistic acts would be more characteristic of older children, male dyads, and the small-interval dyads.

In general, however, our intent in this study was simply to describe naturalistic patterns of sibling interaction along the dimensions of age, sex, and spacing rather than to test specific hypotheses. Aside from differences in patterns of interaction resulting from these variables, more general descriptions of sibling interaction in the home were also a focus of this study. One question at this general level was whether the relatively low levels of interaction reported in the laboratory by Lamb (1978) would also be seen in the home. Another general question was whether the range of behaviors seen between siblings would be greater than the limited number of prosocial acts reported by Lamb (1978) and Samuels (Note 1) in the laboratory. Speculation about the importance of sibling interaction suggests that it is both pervasive and, on occasion, more hostile than laboratory observations would suggest.

Method

Subjects

The subjects were 34 pairs of same-sex siblings from two-child families residing in the middle-class community of Mississauga, Ontario. Sixteen of the sibling pairs were female; 18 pairs were male. The pairs were selected so that the age interval between siblings was either small (1 to 2 years) or large (2.5 to 4 years). Younger siblings were between 1 and 2 years of age and older

siblings were between 2.5 and 4 years or 4 and 5.5 years depending on the age interval between siblings. There were four types of sibling pairs: male small-interval (MS); male large-interval (ML); female small-interval (FS); and female large-interval (FL) (see Table 1 for details about each group).

Insert Table 1 about here

Subjects were recruited by telephoning parents who had previously agreed to participate in experiments at the Infant Studies Laboratory, Erindale College. A majority of parents with children who fit the age and sex requirements of the study agreed to participate.

Observations

Overview. All observations were in the homes of the subjects, usually in the family or living room. There was a total of 68 home visits over a four-month period. Each sibling pair was observed during two one-hour visits spaced one month apart. Observations were made by one of two female observers except for assessment of observer agreement when both observers were present. Both observers recorded behavior in all four groups. It should be noted that the subjects' ages given above were the ages of the children on the first visit.

Procedure. Visits were scheduled to correspond to times the children were likely to be playing together. The mother was told that the observer wanted to watch the ordinary activities of the children and she was asked to go about her normal routine and to ignore the observer as much as possible. The children were told that the observer had come to watch. The observer did not interact with the children, avoided eye contact and answered any queries by briefly saying she was busy doing some work. She sat in a corner of the room where it was possible to see both children. If one of the siblings left the room, the observer stayed with the remaining child. However, behavior was recorded only

when both children were present. If the second sibling joined the first or if both left together, the observer followed. Formal observations began after a brief initial period to allow the children to become accustomed to the observer's presence.

Sampling of behavior. The observer used a behavioral checklist to record the children's behavior and a stopwatch to time the sessions and the number of minutes children were together in the same room. Each sibling pair was observed as a unit. Thus all relevant behaviors emitted by both siblings were recorded during the observation period. A large number of discrete behaviors were recorded and these were grouped into three categories: agonistic behavior, prosocial behavior, and imitation (see Table 2 for a detailed description of the

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Insert Table 2 about here

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particular behaviors). Each time a behavior on the checklist occurred, the behavior, the initiator and the response--to agonistic or prosocial behavior--were recorded (see Table 2 for a detailed description of responses). Responses were recorded but not included as agonistic, prosocial or imitative behaviors. Further the observer recorded only the immediate responses to agonistic and prosocial behaviors--thus each sequence did not go beyond two steps (initiated behavior and immediate response). It should be noted that if two behaviors such as sharing and smiling or pushing and hitting occurred simultaneously, they were recorded as discrete behaviors with discrete responses.

Observer agreement. Measures of observer agreement were obtained by having the two observers simultaneously record behavior during four observation periods, spaced at approximately one-month intervals. Observer agreement was assessed by dividing the number of agreements by the number of agreements plus disagreements. A disagreement was scored if there was disagreement regarding the nature of the particular behavior that had occurred, the nature of the response, or if

one observer recorded an instance of a behavior which the second observer did not record. Overall observer agreement across observations and behavior categories averaged 76.1% (range, 72-78%).

Results

Overall level of interaction. The siblings were observed when they were in a room together. One question that can be asked is whether they stayed in the same room and how frequently they interacted. Although they were free to leave, and sometimes did, there was a strong tendency for them to stay together; the two children were in the same room 90% of the time. More important, they interacted a great deal. The mean number of separate acts initiated per pair was 79.2. The mean number of responses to agonistic and prosocial acts was 39.6 per pair. This includes submissions and counter-attacks in response to agonism and positive and negative responses to prosocial behaviors. Table 3 presents mean frequencies of agonistic, prosocial and imita-

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Insert Table 3 about here

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tive behaviors and responses to agonistic and prosocial behaviors for each group. It is clear that there was a high level of interaction. Moreover, it is important to note that the overall level of interaction was the same for male and female pairs and for small- and large-interval pairs. In other words, this high level of interaction was unaffected by the variables of sex and intervals.

The proportion of prosocial to agonistic acts was computed for each group in order to determine relative amounts of "positive" and "negative" behaviors. As shown in Table 4, the proportion of prosocial to agonistic behavior is clearly

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Insert Table 4 about here

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greater for females than for males and for younger as opposed to older siblings.

Agonistic behavior. The data were subjected to an unweighted means 2 x 2 x 2 analysis of variance with sex and interval as between subject variables and with the behavior of the older and younger members of a pair treated as correlated scores. Several different kinds of agonistic behavior were recorded--physical aggression, object struggles, and verbal aggression. Total agonism was simply the sum of these separate scores. One major finding emerges regarding total agonism--the older children in each pair initiated most agonistic acts. Cutting across the other variables, younger children initiated only about 10% of all agonistic behaviors, a highly significant difference ($F_{1,30} = 69.82$, $p < .01$). Somewhat surprisingly, neither sex nor interval had a significant effect on total agonism. Although boys had slightly higher scores, the difference did not approach significance; and interval did not show even a trend.

A different and more complex pattern emerges when the different types of agonism are considered separately. Since there were so few data for the younger children, only the data for the older children were analyzed by means of a 2 x 2 analysis of variance (sex x interval). There were no differences among groups in the number of object struggles (see Table 3). However, as one might expect, boys engaged in significantly more physical aggression than girls ($F_{1,30} = 12.95$, $p < .01$). Interval made no difference. In contrast, there were no overall differences in the amount of verbal aggression shown by the two sexes, but there was a sex by interval interaction which was marginally significant ($F_{1,30} = 40.35$, $p < .10$). In small-interval pairs, boys engaged in more verbal aggression than in large-interval pairs, while girls showed the opposite pattern, engaging in more aggression in the large-interval pairs.

Prosocial behavior. The same 2 x 2 x 2 analysis of variance described for

agonism was done for prosocial behavior (see Table 3). There was a significant main effect for sex ($F_{1,30} = 11.91$, $p < .01$) and for age ($F_{1,30} = 24.16$, $p < .01$). However, these effects were qualified by a significant sex by age interaction ($F_{1,30} = 12.42$, $p < .01$). Older girls engaged in much more prosocial behavior than any other children. However, in contrast to agonism, the younger children showed a substantial amount of prosocial behavior initiating about 35% of all prosocial acts. Moreover, although there are some slight differences among groups, interval appeared to play little part in determining prosocial behavior. The one group that seemed rather low (though not significantly) is the small-interval younger boys. It might be worth noting that these are the younger brothers of the boys who showed the high degree of verbal aggression. Although there is no evidence on this point, it is conceivable that the two trends were related. However, it should also be pointed out that the overall amount of agonism per pair was uncorrelated with the overall amount of prosocial behavior ($r = -.24$). That is, agonistic and prosocial behavior were not, as might be expected, negatively related.

Imitation. The imitation data were analyzed by means of the same 2 x 2 x 2 analysis of variance. As seen in Table 3, there is a clear reversal of previous trends in that the younger children imitated much more than the older ones ($F_{1,30} = 40.68$, $p < .01$). However, it is important to note that there is no effect of interval or of sex. Children imitated their older siblings just as much when they are only a year and a half younger as when they are three years younger. One other point of some interest is that the older children also engaged in a substantial amount of imitation (about 20%). Although the direction of imitation was usually younger to older, it was sometimes reversed.

Responses to agonism. In order to comprehend sibling interaction as a

reciprocal process, we recorded responses by one sibling following behavior initiated by the other. Responses to agonism were recorded as submissions, counterattacks, or no response. Since the number of opportunities to respond to agonism varied across groups, the frequencies of response in each of the three categories were changed to percentages of total opportunities to respond for each subject. Table 5 gives the mean percentages of each response category

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Insert Table 5 about here

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for each of the eight groups of subjects. Systematic statistical comparisons across groups were not possible; small subject numbers were reduced even further in three groups of older siblings (FS, ML, FL) because a number of these older siblings had no opportunity to respond to agonism. However, there are a number of suggestive differences across groups. For example, there are pronounced differences between the responses of younger and older siblings in both the MS and FS groups, differences mirrored to a lesser extent in the ML and FL groups. In the MS group this difference could be statistically tested. According to the Wilcoxon test (Siegel, 1956), older MS siblings counterattacked more ($T = 0$, $p < .01$), and submitted less ($T = 0$, $p < .01$) than their younger siblings.

As a rough test of overall effects of age, data for all sibling pairs, in which both had an opportunity to respond to agonism, were collapsed across the sex and interval factors. The mean percentages for younger siblings were 44% submissions, 40% no responses, and 16% counterattacks. The percentages for older siblings were 28% submissions, 28% no responses and 44% counterattacks. According to the Wilcoxon test, differences between older and younger siblings were significant for counterattacks ($T = 57.5$, $p < .01$) and for submissions ($T = 92$, $p < .05$) but were not significant for no responses ($T = 118$, N.S.).

Thus the pattern of response to agonism differed for older and younger siblings: younger siblings were more likely to submit and older siblings were more likely to counterattack.

The overall effects of sex and interval were also assessed by collapsing across groups. Sex of the dyad had no effect. Percentages of submissions were 36% for females and 38% for males; percentages of no responses were 38% and 31%; and percentages of counterattacks were 26% and 31%. Interval also had no apparent effect. Percentages of submissions were 36% for small-interval siblings and 39% for large-interval siblings; percentages of no response were 31% and 38%. There was a suggestive difference in counterattacks: small-interval siblings counterattacked more (43%) than large-interval siblings did (23%), but according to a Mann-Whitney U-test (Siegel, 1956), this difference was not significant.

Responses to prosocial. These responses were recorded as positive, negative, or no response. In all groups positive responses were most frequent, no responses were of intermediate frequency, and negative responses to prosocial behavior were relatively rare. Table 6 shows that these percentages are fairly

Insert Table 6 about here

consistent across the various groups. However, there was a slight overall tendency for males to respond positively less often than females (52% vs 61%); according to a Mann-Whitney U-test, this difference was significant ($U = 30.75$, $p < .01$). In addition, males tended not to respond to prosocial behavior more often than females (37% vs 26%), a significant difference ($U = 368.5$, p .05). There were no apparent overall effects of interval or birth-order on responses to prosocial behavior.

Discussion

The sibling pairs observed in this study spent a large amount of time together and directed a large number of behaviors at one another. Further, we observed a wide range of interactions--agonistic as well as prosocial behavior. This is quite different from the laboratory observations reported by Lamb (1978). There are a number of factors in the laboratory setting which could account for this difference--unfamiliarity, brevity of the observations, the competition of a large array of novel toys, and the attentive audience provided by one or both parents as well as their entering and leaving between episodes. We did, of course, arrange our own visits to the home during times when mothers reported that their children were likely to be together, so we do not believe that the level of interaction we observed is necessarily typical or average. Lamb (1978) has suggested that the results of cross-cultural research on siblings are consistent with the low levels of interaction he observed. However, Konner (1975) maintains that sibling interaction is an important aspect of social development in hunter-gatherer societies and among many groups of non-human primates. Whatever the findings from other cultures, the present results suggest that at least in the middle-class families studied here, siblings play an important role in one another's social lives, as speculation in the literature suggests. Further, the differences among the results of the various studies strengthen Lamb's argument for doing research in more than one kind of environment and for observing children in "natural" settings.

While the general findings of high levels of interaction comprising a wide range of prosocial and agonistic acts held for all sibling groups in this study, there were clear differences in patterns of behavior according to age and sex. Age played a large role in the patterning of interactions. The older children

initiated most of the agonistic behaviors. On the few occasions that younger siblings initiated aggression, their older brothers and sisters often retaliated rather than reinforcing agonism by submitting or not responding. In three of the four groups the older siblings initiated about two-thirds of all prosocial behavior. These results do not seem consistent with the suggestion made by Miller and Maruyama (1976) that later-born children have greater social skills. However, the younger siblings in this study were probably too young for this sort of pattern to emerge and it does not seem surprising that older siblings played a somewhat larger role in initiating agonistic and prosocial behaviors since these children clearly have a larger social repertoire. However, the present results could be seen as consistent with Miller and Maruyama in the sense that coercive techniques (agonism) are more characteristic of older children than of their younger siblings. In this context, it should be remembered that there were no age differences in responses to prosocial behavior. The younger and older siblings were equally likely to respond positively, negatively, or not at all.

The pattern for imitation was quite different--younger siblings imitated their older brothers and sisters significantly more often than the reverse. This is consistent with Lamb's study and one would expect that older children would act as models and possibly as teachers for their younger siblings (see, for example, Cicerelli, 1975). The actual content of the imitation, however, was predominantly playful rather than involving behavior that would seem to have implications for learning new skills. Thus, some typical examples of imitative behavior were: pretending to be a monster, dancing around the room swinging arms around, blowing cake crumbs out of one's mouth, banging play dough on the table, saying "pow" and pointing a cane like a gun, and repeating various words and

phrases. There were, of course, some exceptions where it seemed that the younger children might be learning from the example of their older siblings--trying to cut a pattern out of a piece of paper with a pair of scissors, putting lego pieces together in a particular manner, climbing onto a chair to reach the sink, saying the "A, B, C's". While the frequency with which younger siblings imitated their older brothers and sisters has been stressed, it should be remembered that approximately 20% of all imitation was performed by older siblings. The content of the older children's imitation was almost entirely playful, but clearly demonstrates an interest in the behavior of their younger siblings.

Sex was also an important factor in the patterning of sibling interactions. As expected, interactions between female siblings were characterized by a greater proportion of prosocial as opposed to agonistic behaviors, while the opposite was true for the males. This is consistent with the general belief that boys are more aggressive and girls more prosocial. However, with respect to total agonism, we found no main effect for sex--it was only in terms of physical aggression that males significantly exceeded females.

With respect to prosocial behavior the older females (in both intervals) were more likely to engage in positive and nurturant behavior and seemed to act as "little mothers". This is consistent with Konner's (1975) observation that among primates alloparental behavior is typically female, and with the results of Cicerelli (1975) who found that children were more likely to receive and accept help from an older sister than from an older brother. It was also the case that females were more likely to respond positively to prosocial behavior than males, possibly serving to reinforce prosocial interaction between sisters.

There were no sex differences in imitative behavior. Given our other findings that older sisters were less physically aggressive and more nurturant it might have been expected that older sisters would be more likely to act as

models than older brothers. However, this was not found. Younger male siblings showed just as much interest as females in following their older siblings around and duplicating their activities.

Interval, unlike age and sex, seemed to have almost no effect on the patterning of interactions. Despite the many theories about the importance of spacing siblings in particular ways, we were not able to find any appreciable effect of differences in spacing. (It should be noted that in this study interval and age were, to a degree, confounded. That is, the oldest children were always in the large-interval groups. Future studies should examine similar intervals with different aged children in order to assess interval effects clearly.) Our one suggestive finding regarding interval was that in the male small-interval group the older brothers were the most verbally aggressive, were very likely to respond to agonism by counter-attacking, and their younger brothers were least likely to initiate prosocial behaviors. This group, therefore, seems to be characterized by somewhat more "negative" patterns of interaction than the other groups. This is, of course, consistent with the belief that a small interval will lead to increased sibling rivalry. However, overall, our results do not seem to support the idea that spacing is especially crucial to patterns of interactions among siblings, at least for the ages and intervals we observed and for same-sex sibling dyads.

In his discussion of the ubiquity of multi-age (as opposed to same-age) play groups among non-human primates and human hunter-gatherers, Konner (1975) describes some of the possible advantages of multi-age group composition--e.g. protection of the younger members of the group and integrating them into a wider social world. Sibling interactions clearly fall into the category of the multi-age play group and possibly provide similar advantages. Zajonc and Markus

(1975) have suggested that there are clear advantages for the older siblings as well. This study has demonstrated that there is a high level of interaction among siblings in the home and clearly more research is necessary to explore in detail the dynamics and possible functions of this interaction. The categories of behaviors we recorded were limited and only same-sex dyads were observed. However, the data present a picture of rich and varied interactions and indicate that continued research in this area would be both fruitful and fascinating.

Reference Note

1. Samuels, H. The role of the sibling in the infant's social environment. Paper presented at the biennial meeting of the Society for Research in Child Development. March, 1977, New Orleans, Louisiana.

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TABLE 1

Average age (and age range) in months

and number of sibling pairs in each group

		Small interval ($\bar{x}$ = 19.9)	Large interval ($\bar{x}$ = 37.9)
		N = 10	N = 6
Females	younger	21.3 (19-26)	18 (13-24)
	older	42.3 (37-49)	56.3 (48-65
		N = 8	N = 10
Males	younger	20.25 (15-24)	19.1 (16-22)
	older	40 (34-46)	56.5 (52-60

TABLE 2

Behavioral Definitions

Category	Definition
Agonistic behaviors	
I Physical	
1. Physical aggression	Assertive physical contact, specifically: hit, push, pull, shove, kick, bite, pinch, pull hair.
II Object-related	
2. Object struggle	A fight over an object.
III Verbal	
3. Command	An order or demand stated with authority in a loud tone of voice, may be accompanied by threatening facial expressions or gestures.
4. Insult/disapproval	Teasing, name-calling, unfavorable judgements.
5. Threat	Statements of intent to harm, take toys away.
6. Tattle-tell	Telling the mother about the other sibling's "wrong-doing".
Prosocial behaviors	
1. Give/share an object	Give an object spontaneously or on request; let other sibling share an object with which child is already playing--spontaneously or on request.
2. Co-operate/help	Engaging in behaviors which require two individuals; explanations or physical aid.

(continued)

TABLE 2, continued

Prosocial behaviors (continued)	
3. Request	Asking for something (e.g. a toy, help) in a polite manner--low tone of voice often accompanied by positive facial expression.
4. Praise/approval	Verbal statements of approval or admiration of sibling or his behavior.
5. Comfort/reassurance	Verbal or physical consolation when sibling is in some way distressed.
6. Physical affection	Positive physical contact, specifically: hug, kiss, hold hands, pat.
7. Laugh/smile	Facial expression of laughter or smiling directed at the sibling.
8. Approach	Moving to within .5 m. of sibling with no evidence of agonistic intent.
Imitation	Following sibling to another room or another area in room; performing the same behavior as sibling within 10 seconds--imitation was not recorded if an act was apparently elicited by the environment--e.g. bouncing a ball, i.e., only instances of imitating relatively "novel" behaviors were recorded.
Responses to agonistic behavior	
1. Submit	Cry, scream, whine, withdraw, request cessation, give up object, obey.
2. Counterattack	Any direct physical or verbal agonism (following agonistic categories above).

(continued)

TABLE 2, continued

Responses to agonistic behaviors (continued)	
3. No response	No change occurs in ongoing behavior as a result of agonistic act.
Responses to prosocial behavior	
1. Positive	Positive acceptance (following prosocial categories above).
2. Negative	Physical or verbal rejection--hit, push, etc., "no", "go away", etc. (following agonistic categories above).
3. No response	No change occurs in ongoing behavior as a result of prosocial act.

TABLE 3

Mean frequencies of agonistic, prosocial and imitative behaviors and responses to agonistic and prosocial behaviors for older and younger siblings in each group

Sex and Interval	FS		FL		MS		ML	
Age	Younger	Older	Younger	Older	Younger	Older	Younger	Older
Initiations								
Agonism (total	2.0	18.3	3.5	23.6	4.0	32.25	2.7	25.1
Physical	0.6	3.1	0.83	2.0	1.75	9.125	1.6	9.3
Object	1.1	5.6	2.0	8.5	1.625	9.5	1.0	10.6
Verbal	0.3	9.6	0.67	13.17	0.625	13.625	0.1	5.2
Prosocial	12.7	28.3	11.5	27.16	7.125	13.375	13.9	12.8
Imitation	16.8	4.7	14.0	3.3	14.25	6.25	15.5	4.7
Responses								
To agonism								
Counterattack	2.6	0.8	3.5	1.3	5.625	2.125	4.3	0.7
Submit	7.3	0.9	9.5	1.3	14.875	0.75	12.9	0.7
To prosocial								
Positive	17.2	8.0	17.8	6.3	7.5	3.25	7.2	6.4
Negative	3.1	2.0	2.1	2.5	1.375	1.125	1.4	3.1

TABLE 4

Proportion of prosocial to agonistic acts

for younger and older siblings in each group

		Small interval	Large interval
Females	older	1.49	1.02
	younger	6.79	3.95
Males	older	0.49	0.47
	younger	2.12	5.18

TABLE 5

Responses to Agonism

Percentages of Submissions, Counterattacks, and No Responses

Sex and Interval	MS		FS		ML		FL	
Age	Younger	Older	Younger	Older	Younger	Older	Younger	Older
Submit	53	16	38	36	46	34	37	32
Counterattack	14	61	15	52	20	30	16	28
No response	33	23	47	12	33	36	47	40

TABLE 6

Responses to Prosocial

Percentages of Positive, Negative, and No Responses

Sex and Interval	MS		FS		ML		FL	
Age	Younger	Older	Younger	Older	Younger	Older	Younger	Older
Positive	55	48	62	61	53	50	63	58
Negative	8	14	10	15	10	15	12	19
No response	37	38	29	24	37	35	25	23